

Application No. 10/812,687 filed 03/30/2004
Amendment dated 11/14/2005
Reply to Advisory Action of 11/07/2005

Amendments to the Claims

The below Listing of Claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (currently amended): An apparatus for delivering coolant to the area of contact between a workpiece and a contact zone of a rotatable tool on a machine during a machining process, wherein at least two different contact zones of said tool are utilized in the machining of said workpiece, said apparatus comprising:

a plurality of coolant nozzles positionable to direct coolant to the area of contact between the workpiece and the contact zone of the tool,

positioning means for changing the position of said plurality of coolant nozzles concurrently with a change to another contact zone of said tool, whereby during machining with said another contact zone of said tool, coolant is directed to the area of contact between the workpiece and said another contact zone,

wherein said plurality of coolant nozzles are attached to and in fluid communication with a coolant header, said coolant header being positionable with said plurality of coolant nozzles.

2. (cancelled)

3. (previously amended): The apparatus of claim 1 wherein said coolant header is generally ring-shaped.

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4. (previously amended): The apparatus of claim 1 wherein said coolant header is attached to an end of a spindle for rotating said tool.

5. (previously amended): The apparatus of claim 1 wherein movement from one contact zone to another contact zone on said tool comprises movement of said tool relative to the workpiece along at least one axis of motion on the machine, the repositioning of said plurality of coolant nozzles being synchronized with said movement of said tool along said at least one axis wherein a defined amount of movement of said tool yields a predetermined amount of repositioning movement of said plurality of coolant nozzles.

6. (previously amended): The apparatus of claim 5 wherein said tool is a grinding wheel and said repositioning movement of said plurality of coolant nozzles is in a circular arc about said grinding wheel from said one contact zone to said another contact zone.

7. (original): The apparatus of claim 5 wherein movement from one contact zone to another contact zone on said tool comprises movement of said tool relative to the workpiece along one axis of motion on the machine.

8. (previously amended): The apparatus of claim 5 wherein said defined amount of movement of said tool is the same as the predetermined amount of repositioning movement of said plurality of coolant nozzles.

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9. (previously amended): The apparatus of claim 1 wherein said positioning means for changing the position of said plurality of coolant nozzles comprises a cable system.

10. (previously amended): The apparatus of claim 1 wherein said positioning means for changing the position of said plurality of coolant nozzles and coolant header comprises a cable system having a pair of cables, said coolant header having first and second ends with one of said pair of cables being attached to the first end and the other of said pair of cables being attached to the second end.

11. (previously amended): The apparatus of claim 5 wherein said plurality of coolant nozzles are attached to and in communication with a coolant header, said coolant header being positionable with said plurality of coolant nozzles along a circular arc, said positioning means for changing the position of said plurality of coolant nozzles comprising a cable system communicating with and extending between said coolant header and a slide on the machine for effecting said movement of said tool relative to the workpiece along an axis of motion.

12. (original): The apparatus of claim 11 wherein a defined amount of movement of said slide along the axis effects movement of said cable system whereby said coolant header is positioned by an amount along the circular arc equal to said defined amount.

13. (previously amended): The apparatus of claim 1 wherein said positioning means for changing the position of said plurality of coolant nozzles comprises at least one servomotor.

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14. (currently amended): A method for machining a workpiece and delivering coolant to the area of contact between the workpiece and a contact zone of a rotatable tool on a machine during the machining process, wherein at least two different contact zones of said tool are utilized in the machining of said workpiece, said method comprising:

positioning a plurality of coolant nozzles to direct coolant to the area of contact between the workpiece and the contact zone of the tool, said plurality of coolant nozzles being attached to and in fluid communication with a coolant header,

machining said workpiece at the contact zone of said tool and simultaneously delivering coolant through said plurality of coolant nozzles to the area of contact between said tool and workpiece,

moving said tool and workpiece relative to one another to machine said workpiece at another contact zone of said tool,

changing the position of said plurality of coolant nozzles concurrently with said moving to another contact zone of said tool, said coolant header changing position with said plurality of coolant nozzles,

machining said workpiece with said another contact zone of said tool and simultaneously delivering coolant to the area of contact between the workpiece and said another contact zone of said tool.

15. (previously amended): The method of claim 14 wherein said moving occurs along an axis of said machine and in a defined amount, and wherein the change in position of said plurality of coolant nozzles is by an amount that is the same as said defined amount.

16. (cancelled)

17. (previously amended): The method of claim 14 wherein said moving occurs along an axis of said machine and in a defined amount, and wherein the

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change in position of said plurality of coolant nozzles and said coolant header is by an amount that is the same as said defined amount.

18. (original): The method of claim 14 wherein said changing position is along a circular arc.